

What is claimed is:

1. A method for creating a product definition, comprising:

instantiating one or more usage-based product definition inputs;

assessing at least one of an applicability expression, an engineering requirement, and

5 a manufacturing availability expression associated with at least some of the usage-based product definition inputs; and

generating the product definition based on at least some of the usage-based product definition inputs, applicability expressions, engineering requirements, and manufacturing availabilities.

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2. The method of Claim 1, wherein instantiating one or more usage-based product definition inputs includes instantiating a part.

3. The method of Claim 1, wherein instantiating one or more usage-based product
15 definition inputs includes instantiating a requirement.

4. The method of Claim 1, wherein instantiating one or more usage-based product definition inputs includes transforming a coordinate system of a part from a part-centered coordinate system to a product-centered coordinate system.

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5. The method of Claim 1, wherein instantiating one or more usage-based product definition inputs includes instantiating a sub-component having a first configuration, and instantiating the sub-component a second time having a second configuration.

25 6. The method of Claim 1, wherein instantiating one or more usage-based product definition inputs includes instantiating a predetermined component based on a product class configuration rule.



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7. The method of Claim 6, wherein the instantiating a predetermined component based on a product class configuration rule includes instantiating a predetermined component based on a mandatory configuration rule.

8. The method of Claim 6, wherein the instantiating a predetermined component based on a product class configuration rule includes instantiating a predetermined component based on a configuration default rule.

9. The method of Claim 1, wherein assessing at least one of an applicability expression, an engineering requirement, and a manufacturing availability expression includes assessing an option expression.

10. The method of Claim 9, wherein assessing an option expression includes assessing at least one of a default option expression, an available option expression, and a not available option expression.

11. The method of Claim 9, wherein assessing an option expression includes assessing an option from an option category associated to a product.

12. The method of Claim 9, wherein assessing an option expression includes assessing at least one of a mandatory option or a mutually exclusive option.

13. The method of Claim 1, wherein assessing at least one of an applicability expression, an engineering requirement, and a manufacturing availability expression includes assessing a configuration rule, the configuration rule being adapted to at least one of validate a configuration specification and populate a configuration specification.

14. The method of Claim 1, wherein instantiating one or more usage-based product definition inputs includes instantiating a public instance representation of a lower level product by a higher level product.

15. The method of Claim 14, wherein instanting a public instance representation of a lower level product by a higher level product includes filtering the public instance representation through the instance of the higher-level product.

5 16. The method of Claim 1, wherein instanting one or more usage-based product definition inputs includes instanting in accordance with a configuration at location option by a customer.

10 17. The method of Claim 1, wherein at least one of instanting one or more usage-based product definition inputs includes instanting in accordance with a unitized manufacturing assembly plan.

15 18. The method of Claim 1, wherein assessing at least one of an applicability expression, an engineering requirement, and a manufacturing availability expression includes assessing in accordance with a unitized manufacturing assembly plan.

19. The method of Claim 1, further comprising defining a sub-component configuration definition.

20 20. The method of Claim 1, wherein assessing at least one of an applicability expression, an engineering requirement, and a manufacturing availability expression includes assessing an applicability expression, assessing an engineering requirement, and assessing a manufacturing availability expression.

25 21. A method for creating an air vehicle definition, comprising:
instanting a usage-based fuselage definition input, the usage-based fuselage definition input including at least one of a fore body definition input, a mid body definition input, an aft body definition input, a wing definition input, a vertical tail definition input, and a horizontal tail definition input;



instanting a usage-based propulsion system definition input;
assessing at least one of an applicability expression, an engineering requirement, and
a manufacturing availability expression associated with at least some of the definition inputs;
and

5 generating the air vehicle definition based on at least some of the definition inputs,
applicability expressions, engineering requirements, and manufacturing availabilities.

22. The method of Claim 21, wherein instancing at least some of the definition
inputs includes transforming a coordinate system of a component from a component-centered
10 coordinate system to an air vehicle-centered coordinate system.

23. The method of Claim 21, wherein instancing at least some of the definition
inputs includes instancing a predetermined component based on a product class configuration
rule.

15 24. The method of Claim 23, wherein the instancing a predetermined component
based on a product class configuration rule includes instancing a predetermined component
based on a mandatory configuration rule.

20 25. The method of Claim 23, wherein the instancing a predetermined component
based on a product class configuration rule includes instancing a predetermined component
based on a configuration default rule.

26. The method of Claim 21, wherein assessing at least one of an applicability
25 expression, an engineering requirement, and a manufacturing availability expression includes
assessing at least one of a default option expression, an available option expression, and a not
available option expression.

27. The method of Claim 21, wherein assessing at least one of an applicability
30 expression, an engineering requirement, and a manufacturing availability expression includes




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assessing a configuration rule, the configuration rule being adapted to at least one of validate a configuration specification and populate a configuration specification.

28. The method of Claim 21, wherein instanting at least one of the definition
5 inputs includes instanting a public instance representation of a lower level product by a higher level product.

29. The method of Claim 28, wherein instanting a public instance representation
of a lower level product by a higher level product includes filtering the public instance
10 representation through the instance of the higher-level product.

30. The method of Claim 21, wherein at least one of instanting the definition
inputs and assessing at least one of an applicability expression, an engineering requirement,
and a manufacturing availability expression includes at least one of instanting and assessing
15 in accordance with a unitized manufacturing assembly plan.

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